Electrical Convulsant Therapy

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Historical.

Meduna in 1934 introduced therapeutic convulsions for schizophrenic states on the assumption, later proved to be quite erroneous, that there was an antagonism between dementia præcox and epilepsy. Meduna used various convulsant agents before finally discovering the advantages of cardiazol. Although convulsant therapy was found to be disappointing for dementia præcox, the condition for which it was introduced, many observers began reporting good results in depressive states. Convulsant therapy by chemical means, however, had a good many disadvantages, the chief being the anxiety of the patient while awaiting his intravenous injection and before the onset of the fit. In many cases it was found impossible to persuade the patient to complete the course. In 1938 Cerletti and Bini finally perfected an electrical method of inducing convulsions which had the advantage that loss of consciousness was instantaneous, thereby ensuring complete amnesia for the whole event and consequently no apprehension on the part of the patient for subsequent convulsions.

Electrical convulsant therapy (E.C.T.) in mental disease has now been in fairly general use in the British Isles for the past three or four years, but it was not until October, 1943, that we were able to obtain an apparatus in Armagh. Since that date, up to December, 1944, we have treated sixty-nine patients, in whom we induced almost six hundred convulsions, and this paper is an attempt to assess the value of this addition to psychiatric treatment.

Technique.

Patients exhibiting any marked degree of cardio-vascular degeneration or any suspicion of pulmonary tuberculosis are excluded. Other contra-indications mentioned in the literature are such fairly obvious conditions as osteo-arthritis, spinal curvature, bone atrophy, thyrotoxicosis, malignancy, and thrombophlebitis. Age in itself does not appear to be a contra-indication, but the oldest patient in this series was 56. A cup of tea only is given on the morning of treatment, and the bladder is emptied just prior to treatment. The patient lies on an ordinary bed or couch with only a light covering blanket. Good electrical contact is ensured by swabbing the temples with spirit followed by saline, and the connecting pads of the head-band are liberally soaked with strong saline. The accurate working of the apparatus can first be tested by means of a "dummy patient" which has a fixed resistance, and when the head-band has been carefully adjusted the resistance of the actual patient is then noted. This resistance is no guide to the voltage required to produce a fit and is only of value in subsequent treatments, as a sharp rise in the patient's resistance usually indicates that contact is faulty somewhere. We always begin treatment by using a voltage of 130 and a time of .2 second (Cox-Cavendish Apparatus). If this fails to produce a fit, either the

voltage or time or both may be increased. Likewise a long delay before the actual fit develops will also call for an increase on the next occasion. Some patients never require an increase, whereas others have to be stepped up to the maximum of 150 volts and to .4 or .5 second; two of our patients eventually required .65 second. A rubber gag is inserted into the mouth (false teeth, of course, being removed, and also hairpins) before the shock button is pressed, but if the patient objects to this one can wait and insert it when the tonic stage begins. One assistant exerts pressure on the lower jaw to prevent dislocation, and two other assistants control the movements of the limbs but do not exert pressure on them. It is, I think, important not to obstruct the strong flexor movements of arms and legs. As soon as the clonic stage appears to be ending, the patient's head is turned over the side of the bed to allow saliva to dribble from the mouth, and as soon as regular breathing has restarted the patient is removed on a stretcher. In the average case we give treatment on alternate days, but in some very acute cases a daily shock for one or two weeks or even longer may be of considerable value. Unless a fit occurs no benefit whatever appears to result, and it may be advisable to repeat in half an hour or the following day. Sargant and Slater in an otherwise excellent account describe a much more elaborate technique in which the patient is largely immobilised, but I am not convinced of the necessity of this, and some of their reasoning is difficult to follow.

Complications.

Many complications including fractures of the femur and crush fractures of the vertebræ have been described. The latter were only diagnosed radiologically and only appeared to give rise to some pain in the back. In our series there were two cases of dislocated jaw. Treatment was discontinued in one case because it seemed to produce an undue amount of circulatory shock, and in another case because there was an undue delay in the restarting of respiration.

Results.

Excluding the two patients in whom treatment was stopped after the first or second convulsion, the remainder—sixty-seven patients—could be divided into the following groups: Melancholia (thirty-four cases), paraphrenia (chronic delusional insanity with hallucinations) (nine cases), dementia præcox (ten cases), recent mania (one case), and a miscellaneous group (thirteen cases) consisting mainly of patients exhibiting recurring attacks of excitement with impulsiveness and destructiveness or episodes of refusal of food. Many of this group were partially demented or feeble-minded patients to whom the treatment was given in the hope that it would lessen excitability or destructiveness or promote appetite, and all were old-standing cases.

To take the last group first, there was no recovery in this group. In a number of cases periodic refusal of food or destructiveness was definitely cut short and the nursing anxieties considerably lessened. There was no evidence though that this treatment will have any effect in reducing the frequency of such periodic episodes.

Only one case of recent mania in a single woman of twenty-seven years was

treated. This patient ultimately made a good recovery in four and a half months, but I had the impressioon that she would probably have recovered more quickly without the treatment. Extremely little has been published about the effect of E.C.T. in mania; the results, however, so far published appear much less favourable than in melancholia. Recent mania as a rule responds very quickly to ordinary psychiatric treatment, but with further experience of E.C.T. a field of usefulness may be uncovered, especially in the prevention of delirious states. I shall refer to this later.

In the paraphrenic group only one of the nine patients treated appeared to benefit, but it is unlikely that she will ever recover sufficiently to be discharged.

In the dementia præcox group all the ten patients treated were well established cases, and in none of them did there appear anything but very temporary benefit. Some writers have recorded good results in very early cases of dementia præcox, but in some of these I have a suspicion that the condition may actually have been a melancholic psychosis with confusion, which is often very difficult to differentiate from dementia præcox. However, in such cases there is no harm in giving the patient the benefit of the doubt, as the treatment appears to be harmless. It is wise, though, in dementia præcox cases especially, to take extra nursing precautions, as some patients become extremely impulsive during the treatment.

When we come to depressive conditions, however, I am glad to be able to present a slightly different picture. Of the thirty-four patients treated, twenty-six have already recovered and are doing well at home, and one, although completely recovered, is learning forestry on our farm prior to discharge to take up similar work. One patient is definitely improved both mentally and physically, and is allowed parole, but a residue of depression is still in evidence. Two female patients are still under weekly "maintenance" doses, to which I shall refer later. Only four cases therefore out of the thirty-four treated appeared to gain no benefit. Two of these cases were re-admissions whose first mental symptoms dated back a number of years. The third case, although apparently recovering completely from each series of convulsions, repeatedly relapsed into a semi-stuporose condition. We are now giving her a long rest before trying her again. The fourth case was a hypomanic male patient who was admitted in his fourth attack of melancholia. He recovered quickly under E.C.T., but soon relapsed, and we are now allowing recovery to proceed by natural means.

I think it would be helpful to give brief histories of some of these cases. The following three cases, with some others, were all in the hospital a considerable time before we obtained our apparatus.

C. F. Adm. 22/8/42. Aged 48. Married. Acutely depressed on admission. Suicidal. For a few months after admission patient showed some improvement, but this was not maintained, and for the whole of 1943 she was depressed, suicidal, and under special observation. E.C.T. commenced 4/1/44. Nine convulsions given. No apparent improvement at end of course, but three weeks later marked improvement set in, and she was discharged "recovered" on 1/4/44.

M. McA. Adm. 13/4/42. Female. Aged 40. Single. Weaver. Dull and

depressed on admission. Poorly nourished. Vacant expression. Answers in monosyllables if at all. Difficult with food. Spoon-feeding often required and sometimes tube-feeding. Remained as above until May, 1944. E.C.T. commenced 30/5/44. Brighter after third convulsion. After fifth convulsion rational and cheerful. Anxious to write home. Eight convulsions given in first course. Discharge arranged for July, when patient relapsed. Five more convulsions given in July, after which patient was again much improved, but improvement only lasted one week. Allowed to rest until October. Three further convulsions given early in October, following which patient appeared fully recovered, and treatment discontinued. Remained well, and discharged 22/12/44. Continues to do well. Sixteen convulsions given in all three courses.

D. R. Adm. 13/6/38. Aged 39. Single. Farm labourer. Depressed and worrying. Sleepless and agitated. In October, 1938, he began to mutter incoherently to himself and became completely inaccessible. Remained in this condition without any variation until July, 1944. E.C.T. commenced 6/7/44. Spoke a few rational sentences after fourth convulsion. After fifth convulsion spoke rationally and freely. Received six convulsions in all. Remained rational and cheerful and full of interest in everything. Complete amnesia for the whole of his period in hospital. Never heard of the war. Annoyed and amused at losing six years of his life. Discharged 6/9/44. Visited hospital 10/2/45. Has remained well and working continuously since discharge.

The following eight cases were recent admissions and are typical examples of our experience. In the first case we did not use E.C.T. for some months after admission, as we were then to some extent feeling our way.

M. C. Adm. 4/12/43. Aged 53. Married. Embroiderer. Depressed. Agitated. Delusions of syphilitic infection. Took food badly. Lost weight. No improvement when E.C.T. commenced in May, 1944. After second convulsion much brighter. Began to smile. After fourth convulsion said he "felt a different man." Seven convulsions in all given. Improvement maintained, and discharged "recovered" 10/6/44. Has continued to do well. When E.C.T. treatment was decided upon this patient's physical condition was beginning to cause anxiety. He was steadily losing weight, continually restless, acutely depressed, picking at his skin, etc. This condition was completely transformed within one week.

E. McG. Adm. 7/4/44. Aged 20. Married. Depressed. Weeping. Delusions that she is frightening other people. Symptoms present for two months following premature birth of twins—with considerable hæmorrhage. E.C.T. commenced 29/5/44. Marked improvement after fourth convulsion. Eight convulsions given. Improvement fully maintained. Allowed out on parole. Discharged "recovered" 30/6/44. Has continued to do well.

G. C. Adm. 31/7/44. Aged 55. Married. Card Loom Worker. Depressed. Full of worries. No interest in work. "Would rather be dead." E.C.T. commenced 11/8/44. Four convulsions given. Stated after fourth convulsion that he was too sore to stand any more. Very much brighter. Week later stated he was "one hundred per cent. better." Improvement fully maintained, and

discharged "recovered" 18/10/44. Has continued to do well. This was a depressive illness which ordinarily speaking might have been expected to last six to eight months. Recovery was actually complete in just a month from admission, but patient was in no hurry to go home, and remained another seven weeks.

M. K. Adm. 8/9/44. Aged 38. Married. Depressed. Weeping. Unable to look after children. Symptoms present for nine months following illness of youngest child, when patient lost sleep for about a month. E.C.T. commenced 9/9/44. Six convulsions given. Improvement immediate, and no weeping after fourth convulsion. Patient continued to improve steadily following cessation of treatment. Allowed parole outside grounds. Became steadily more self-confident, and was discharged "recovered" 30/11/44.

T. K. Adm. 7/6/44. Aged 31. Single. Farm Labourer. Depressed and extremely confused on admission. Absolute sleeplessness in spite of sedation. Toxic and delirious symptoms of great gravity began to develop, and in view of the hopeless outlook with the usual methods of treatment it was decided to try E.C.T. E.C.T. commenced 10/6/44. Five convulsions given. The toxic and delirious symptoms disappeared after first convulsion and never re-appeared. A week following cessation of treatment he developed a pneumonic consolidation at one base, and this was extremely slow in clearing up, but eventually he made a good recovery, and was discharged 13/10/44. Has continued to do well.

R. P. Adm. 14/4/44. Aged 56. Married. Depressed. Delusion that the devil is in her ear. Restless and agitated and continually picking at ear to get the devil out. Caused considerable septic inflammation of outer meatus. E.C.T. commenced 20/5/44. Eight convulsions given. Depression and agitation disappeared completely after sixth convulsion. Discharged 1/7/44. Has remained well.

B. M. Adm. 1/9/44. Aged 32. Single. Housekeeper. Depressed. Said "she was going off her head." Sleepless. Unable to do her work for previous six weeks. E.C.T. commenced 12/9/44. Four convulsions given. Treatment stopped on account of excellent response. Patient apparently completely recovered. Maintained improvement, and discharged 6/10/44. Visited hospital subsequently and said "she felt better than she had been for years."

A. B. Adm. 14/12/44. Aged 54. Fitter. Emaciated. Very depressed. Refusing food at home. Delusions of bowels being stopped. E.C.T. commenced 15/12/44. Seven convulsions given. Began to eat and sleep well after first convulsion. No depression or delusions in evidence after fifth convulsion. Put on weight rapidly. Remained well, and discharged 3/2/45. This man made a complete recovery from a very acute melancholic illness in under eight weeks. Prior to E.C.T. one would have been well satisfied to have obtained this result in eight months.

Taking sixteen recent admissions exhibiting depression, where the treatment was instituted comparatively early, the average length of stay in hospital was $2\frac{7}{8}$ months—shortest period one month, longest five months. The average number of convulsions given to these patients was ten. In comparing this with an analysis of a similar series of recovered melancholic cases which I carried out some years

ago, I am satisfied that E.C.T. considerably more than halves the length of stay in hospital. Apart from definite melancholia, cases which one might label 'anxiety neurosis' would seem to do equally well. Case M. K., whom I saw in the first instance at Lurgan Out-Patient Clinic, was a typical case exhibiting weeping and anxiety. Anxiety hysteria, often confused with anxiety neurosis, is of course an entirely different affection. It should rarely require this treatment, nor does shock therapy appear to be particularly successful in hysterical states.

In view of the success of E.C.T. in a case of delirious melancholia, T. K., I wondered what effect it would have in that equally rare but more intractable condition known as delirious mania. This condition frequently resists all treatment, the patient sinking into a delirious and semi-comatose condition with usually a terminal broncho-pneumonia. On 7th February, 1945, a female patient, M. J. McC., aged 63, was admitted in a very exhausted, maniacal condition. Her condition remained stationary for about ten days, but on 17th February it was evident that the excitement had passed into a delirium—with continuous incoherent chattering, obliviousness of surroundings, extreme restlessness, red dry tongue, some bronchitis and pyrexia. On account of the extremely poor outlook with the usual methods of treatment, I decided to try E.C.T. Convulsions were given daily for five days, beginning on the 17th. Following the first convulsion there was a definite lessening of delirium, and following the second, the patient rested and slept naturally throughout the following day and night. She now coughed up the bronchial secretion which previously had gurgled up and down in the bronchial tubes. Improvement has been fully maintained, and there has been no return of delirious symptoms, although the patient still remains in a condition of mania.

Our practice has been to give one or two additional convulsions after all the depression has apparently disappeared. A return of depression is similarly dealt with. To continue unduly with this treatment—after depression has completely gone—would seem to run the risk of inducing elation or confusion. In some cases patients appear completely self-confident as soon as the course is finished. In others, although there is no depression, a variable time is required before the patient completely regains self-confidence. Temporary loss of memory during the treatment is sometimes puzzling to the patient, but is of no account. A feature of the treatment is the marked increase in appetite which it induces. Patients who were spoon- or tube-fed can scarcely be satisfied, and the weight literally jumps up.

Prognosis in melancholia was of course always relatively good, but with E.C.T. the period of hospitalization is greatly reduced. The treatment, moreover, promises practically to eliminate those triple bogies of melancholia—suicidal attempts, gradual loss of weight ending up in exhaustion and circulatory collapse, or the appearance of intense depression with restlessness, sleeplessness, and confusion, ending up in melancholic delirium. In addition, the distressing symptoms of the actual mental depression are removed almost overnight and natural sleep almost immediately restored.

Relapses following the cessation of a course of treatment are not uncommon, as in the case of M. McA., who required three courses. Between the second and third

courses we allowed her to remain depressed and confused for three months. In the last course three convulsions only were sufficient to restore her to complete normality, and she never subsequently showed any tendency to relapse. In two cases, still in hospital, a weekly 'maintenance' dose keeps them cheerful, rational and well occupied; without this both would relapse in the course of another week or so into a depressed, confused, resistive condition, giving considerable difficulty with food. Until, of course, the tendency to relapse disappears, if at all, it will be impossible to discharge them. Further experience should throw a good deal of light on the problems presented by such patients, and I anticipate that in the light of this experience we should be able to use this treatment with much greater finesse.

I might perhaps summarise my experience to date of this form of treatment.

E.C.T. does not appear to give any further hope in those sad cases sometimes known as the *malignant* psychoses—dementia præcox and paraphrenia. In manic states there is not much definite evidence of its value; one case would suggest that it may be very useful in delirious mania. In depressive states at all ages, and in all degrees of severity, from simple anxiety to melancholic delirium, it would appear to be one of the most important additions to treatment in the long and tortuous history of psychiatry.

REFERENCE.

SARGANT AND SLATER: *Physical Methods of Treatment in Psychiatry.*

REVIEW

THE QUARTERLY REVIEW OF PÆDIATRICS. THE QUARTERLY REVIEW OF PSYCHIATRY AND NEUROLOGY. THE QUARTERLY REVIEW OF UROLOGY.

THE Washington Institute of Medicine announces three important additions to its already imposing list of Quarterly Reviews. The first of this—Quarterly Review of Pædiatrics, which will appear under the direction of a strong editorial board representative of many medical schools in the United States and Canada, with Dr. Irving J. Wolman of the Children's Hospital, Philadelphia, as editor in chief. Its prime function is to make it feasible for the busy physician to keep abreast of the most recent progress in all branches of pædiatrics with a minimum of time and effort. Abstracts are prepared by trained bibliographers, most of whom are physicians, and explanatory or critical comments are added where necessary. The Quarterly Review of Psychiatry and Neurology will perform a similar task in its special subjects under the editorship of Professor Winifred Overholser of the George Washington University School of Medicine. The table of contents of the first issue ranges over very wide fields in psychiatry and neurology. The Quarterly Review of Urology has Dr. Hugh J. Jewett as editor in chief, and the members of his Board "are charged with the responsibility of selecting from every dependable source all contributions which in their judgment are of fundamental importance and unusual merit, to which they may add their own comments."